

### Editorial

## A consolidated European Union and Euro Area Supply-Use System and Input-Output Tables



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Dear IIOA member,

This past May 2011, for the first time ever, Eurostat published a consolidated annual Supply-Use system and Input-Output Tables for the European Union (EU) and the Euro Area. The period covered was from 2000 to 2006. This new database was the result of a fruitful collaboration between Eurostat and the European Commission's Joint Research Centre-IPTS, supported by National Statistical Institutes from several European Member States and researchers from the Konstanz University of Applied Sciences (Germany), the University of Groningen (Netherlands) and the Norwegian University of Science and Technology (NTNU). The project was initiated in 2008 by our late colleague Peter Ritzmann at Eurostat.

Under the European System of National and Regional Accounts (ESA95), EU Member States transmit annually to Eurostat Supply and Use Tables (SUT) and Input-Output Tables (IOT), five yearly. The compilation of SUTs is very time- and resource-consuming; still, they are submitted only 36 months after the end of the reference period. A Supply Table shows the supply of goods and services by product and type of supplier at basic prices, while the Use Table depicts the use of goods and services by product and user categories at purchaser prices. These transmitted tables constitute the starting point for a sequence of adjustments leading to a consolidated data set for the consolidated EU and the Euro Area.

For each Member State, SUTs at basic prices were estimated with the available SUTs (in basic/purchaser prices) and (in part confidential) auxiliary valuation data (trade and transport margins and taxes less subsidies on products). Due to confidentiality reasons the SUTs were published only for the consolidated EU and Euro Area. The SUTs for the individual Member States were aggregated to EU and Euro Area SUTs in a step-wise procedure. For each Member State, the Use Table was divided into an Import and Domestic shares, and subsequently, in an intra-EU Import Use Table and an extra-EU Import Use Table. The same applies for the Euro Area. Each of the domestic use, intra-EU import use and extra-EU import use tables were aggregated across countries to an EU total.

Further adjustments were carried out with the purpose of confronting and rebalancing the intra-EU import use total with the intra-EU export supply totals - which, in theory, should be identical apart from valuation differences. However, in practice, they did not match mainly due to the fact that the data are collected and reported independently by different countries and hence, were subject to possible definitional differences.

The relatively small intra-EU export/import differences found were transferred to the rest of the world account. The intra-EU import use and intra-EU export supply data were then made identical so as to cancel each other out. The last sub-step was to aggregate the individual country domestic SUTs together with the intra-EU import uses and, at the same time, to deduct the intra-EU export supplies in order to avoid double counting.

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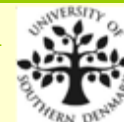
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#### Published papers in Input-Output Analysis and related methods

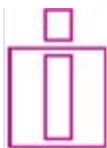
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Postdoctoral Positions in Environmental and Resource Economics



[http://www.jobs.sdu.dk/vis\\_stilling.php?id=6502&lang=eng](http://www.jobs.sdu.dk/vis_stilling.php?id=6502&lang=eng)



The consolidated SUTs were subsequently transformed into symmetric product by product input-output tables (IOTs) using the so called industry technology assumption (see Model B, Eurostat Manual of Supply, Use and Input-Output Tables, p. 349). A product-by-product IOT showed how much of each product was used as input for the production of another product. Similarly, it also showed how much of each product was consumed by different user categories (production, households, government, non-profit institutions serving households, investment and foreign trade).

The resulting dataset comprises in total for the EU and the Euro Area: Supply, Use and Input-Output Tables at basic prices, distinguishing between domestic and import uses. To date, the period covered ranges from 2000 to 2006, but will be extended to 2007 in autumn 2011. The tables come in two resolutions with 60 products and 60 industries and with 6 products and 6 industries.

Notwithstanding the great work achieved so far, there are also great challenges coming soon in the construction of a stable and longer time series of consolidated SUTs at basic prices for the EU and the Euro Area. They refer to the new revisions of the NACE classification and the ISIC Standard International Trade Classification system, which will be applied by National Statistical Institutes from 2008 onwards. But that is another story that we will tell you in due time.

Thank you for your attention and enjoy the new tables!

Isabelle Remond-Tiedrez (Eurostat)

José M. Rueda-Cantuche (Joint Research Centre's IPTS)

NOTE: More information on the technical details of the EU and Euro Area SUT-IOTs are available at: [EU and Euro Area SUT-IOTs 2000-2006](#) and the database is available at: [Eurostat's workbooks by countries and EU/Euro Area](#)



### Tales from the I-O world

#### The 19th IIOA Conference in Alexandria: a short chronicle

Dear readers,

The 19th International Input-Output Conference was held this year in Alexandria, USA, from the 13th to the 17th of June. Loyal to its tradition, also this year the annual IIOA Conference gave the opportunity to researchers, scholars, officials and practitioners to share new ideas, confront experiences and propose advances on Input Output analysis and all the related analytical techniques. The 19th IIOA Conference program attracted more than 200 scholars, and delegates from Universities, Statistical Offices and Governmental



Rutgers University, Center for Urban Policy Research

Institutions from virtually all over the world including large representations of emerging economies.

The themes covered by the conference program were also this year as diverse as the topics and issues related to the use of Input Output techniques of analysis.

Data construction, National Accounts, CGE and econometric I-O model as well as a large number of sessions dedicated to the use of I-O techniques for environmental analysis, e.g. carbon footprint, MFA and LCA, are only some of the main research topics addressed during the parallel sessions of the conference.

Few distinguished scholars address instead more general issues during the plenary sessions. Professor Clopper Almon, from the

University of Maryland, talked about the social role of Input-Output analysis. Paul Cheung, the Director of the United Nations Statistics Division discussed how the United Nations Statistics Division can assist national statistics offices in developing a comprehensive program of IO data development.



Satoshi Inomata, Prof. Ronald Miller, Prof. Geoffrey Hewings, Bo Meng at the meeting in Alexandria

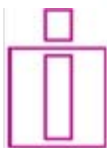
Dr. Bart Los presented the results of a bibliometric study showing quantitative evidences of the impact of Input Output analysis in the academic circles. Professor Ron Miller on: Reflections on Unplanned Encounters with Input-Output. And Graham Pyatt on the importance of the National Income/Social Accounting matrices for the analysis of the Distribution of Wealth and Living Standards.

Also this year the IIOA has awarded a young scholar, i.e. under the age of 40, with the Leontief Memorial Prize for the best article. The Prize was awarded this year to Sangwon Suh, from the University of California in Santa Barbara. The author presented a paper titled "Tracking metal flow network using hybrid Ghoshian framework", which presented an interesting use of the Ghosh's framework to analyze the flows of metals, i.e. lead, zinc, manganese, aluminum,

# Newsletter

## International Input-Output Association (IIOA)

Number 15; August, 2011



and molybdenum in the economy of South Korea. With respect to the past IIOA annual meeting, the Conference had this year also an important novelty: the International School of Input Output Analysis. The topics of this first year of the school were a) Multiregional Input Output models, b) from Supply and Use tables to symmetric I-O tables and c) about the construction of Social Accounting Matrices. The scope of the School was presented in the issue 13th of the IIOA newsletter, i.e the February issue. The 19th IIOA Conference was sponsored by the Regional Research Institute and the Inforum of the University of Maryland and the full list of submitted papers can be downloaded from the IIOA website (<http://www.iioa.org/Conference/19th/>).

The next IIOA meeting will be held in Bratislava from the 25th to the 29th of June 2012, while the School of I-O on the day before, 24 June. More details will be published on the newsletter in the next months.

Ignazio Mongelli (Editor of the Newsletter)



### Doctorate School in Economics and Management focused on multi-sectoral techniques.

Dear IIOA colleague/member,

For the years 2012-2015 the University of Macerata, in partnership with the University of Cattolica del Sacro Cuore (Milano) and University of Pavia, has set up a new curriculum for the Doctorate School in ECONOMICS AND MANAGEMENT (QMPA) focused on multi-sectoral techniques.

The QMPA curriculum will offer lectures, seminars, workshops and short term training programs - held by the internal academic staff and by external academic and non-academic speakers - focussed on:

- 1) Input-output analysis;
- 2) SAM models;



Macerata (Italy)

In order to encourage the application of foreign candidates, the selection will be done considering two main factors: 1. a research project developed by the candidate and two letters of reference from experts; 2. a telematic interview only for the candidates who pass the minimum mark specified in the application form.

Admission does not depend on a minimum number of scholarships. The deadline for the application form submission is fixed on 26 August 2011. Please find the notice and a copy of the application form which must be presented only via web here: <http://www.unimc.it/sda/bando/call>. For any other information please contact the doctorate office (Dr. Laura Bettucci, [laura.bettucci@unimc.it](mailto:laura.bettucci@unimc.it)) and if necessary Prof. Maurizio Ciaschini ([ciasco@unimc.it](mailto:ciasco@unimc.it)), Prof. Claudio Soggi ([soggi\\_claudio@unimc.it](mailto:soggi_claudio@unimc.it)) or Prof. Rosita Pretaroli ([pretaroli@unimc.it](mailto:pretaroli@unimc.it)).

Best regards,

Maurizio Ciaschini and Claudio Soggi



### Interregional Input Output Software

Check the website:

<http://www.regroingen.nl/irios/irios.html>

Published papers in  
Input-Output  
Analysis and related  
methods.

### In the next ESR issue

Economic Systems Research -

Journal of the IIOA

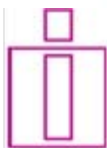
Volume 23, Issue 3 (September 2011)

<http://www.tandf.co.uk/journals/titles/09535314.asp>



**RUEDA-CANTUCHE J.M. ECONOMETRIC ANALYSIS OF EUROPEAN CARBON DIOXIDE EMISSIONS BASED ON RECTANGULAR SUPPLY-USE TABLES**

This paper formalises the so-called Supply-Use Based Econometric (SUBE) approach that allows for the introduction of econometric analysis in the calculation of backward input-output multipliers of the Leontief type quantity model, using rectangular supply and use tables. The SUBE approach does not require any kind of inverse matrix and incorporates the traditional approach (with square supply-use tables) as a particular case. The empirical analysis shows that the SUBE carbon dioxide multipliers for the EU27 are considerably lower than those obtained by the traditional Leontief inverse. In an application of the SUBE approach, the European economy appears to emit about 10% less carbon dioxide than in a situation in which it would not import any intermediate inputs from outside the EU27.



**DUCHIN F. AND LEVINE S. SECTORS MAY USE MULTIPLE TECHNOLOGIES SIMULTANEOUSLY: THE RECTANGULAR CHOICE-OF-TECHNOLOGY MODEL WITH BINDING FACTOR CONSTRAINTS**

We develop the rectangular choice-of-technology model with factor constraints, or RCOT, a linear programming input-output model for analysis of the economy of a single region. It allows for one or more sectors to operate more than one technology simultaneously, with the relatively lowest-cost one supplemented by others if it encounters a binding factor constraint. The RCOT model solves for sector outputs, goods prices that are set by the highest-cost technologies in use, and scarcity rents that correspond to binding factor constraints experienced by the lower-cost technologies. The model is motivated by the fact that mineral deposits of different qualities may be exploited simultaneously, as may primary and recycled sources for the same materials or irrigated and rain-fed techniques for producing the same crop. RCOT generalizes Carter's square choice-of-technology model, in particular adding the factor constraints that allow several alternatives to operate simultaneously. The Appendix gives a numerical example.

**PETERS G. AND YAMAKAWA A. STRUCTURAL DECOMPOSITION ANALYSIS OF GREENHOUSE GAS EMISSIONS IN NORWAY 1990-2002**

The goal of this study is twofold: first, to quantify the economic factors driving greenhouse gas emissions in Norway, and second, to assess if random variations in the data affect the results. We use structural decomposition analysis (SDA) with chained constant price input-output tables and environmental extensions. We construct three sets of constant-price data using a smoothing algorithm to remove random variations from the data, and find that the results of the SDA are relatively robust to these variations. The production of exports was responsible for around 70% of the growth in greenhouse gas emissions from 1990 to 2002, household consumption of domestically produced products for about 15%, government 10%, with the remainder due to gross capital formation. The dominance of exports in the emissions growth may make future greenhouse gas mitigation challenging in Norway, particularly considering that the exports are dominated by oil and gas production.

**GUERRA A.I. AND SANCHO F. REVISITING THE ORIGINAL GHOSH MODEL: CAN IT BE MADE MORE PLAUSIBLE ?**

We reconsider in this paper the alleged implausibility of Ghosh's model and we do so reformulating the model to incorporate an alternative closure rule. Our proposed closure rule is in line with the original allocation rules defined by A. Ghosh. The closure solves, to some extent, the implausibility problem that was pointed out by Oosterhaven, for then value-added is correctly computed and responsive to allocation changes resulting from supply shocks. Some numerical examples illustrate the sectoral and aggregate consistency of the allocation equilibrium.

**MICHAELIDES P., BELEGRI-ROBOLI A. AND MARKAKI M. LABOUR PRODUCTIVITY CHANGES AND THE WORKING TIME: THE CASE OF GREECE**

In terms of the annual hours worked per employee, Greece ranks first among EU-15 countries and second among OECD countries. In this context, the austerity measures it adopted (as suggested by the EU and IMF) imply, among other things, a reduction in the over-hours. If such reductions were not to be accompanied by increases in labour productivity, output would be reduced considerably. This paper therefore addresses the question: "What change in sectoral labour productivity levels would have been required to deliver the actual change in final demands in Greece between 1995 and 2005, if working hours in each sector had been reduced to their EU averages?" In this framework, we develop a methodology for calculating labour productivity change by sector of economic activity in an input-output context. Next, we apply it to the Greek economy for the time period 1995-2005, the most recent period for which the required data are available. We find that the required productivity changes are the most substantial for the hotels and restaurants sector, followed by machinery manufacturing and the trade sectors.

**Job Openings for Economist  
check the website**

<http://www.aeaweb.org/joe/>



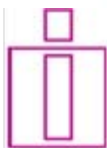
## Highlights in journals

**WIEDMANN T.O., SUH S., FENG K., LENZEN M., ACQUAYE A., SCOTT K. AND BARRETT J. APPLICATION OF HYBRID LIFE CYCLE APPROACHES TO EMERGING ENERGY TECHNOLOGIES - THE CASE OF WIND POWER IN THE UK. ENVIRON SCIENCE AND TECHNOLOGY 2011; 45(13):5900-7.**

Future energy technologies will be key for a successful reduction of man-made greenhouse gas emissions. With demand for electricity projected to increase significantly in the future, climate policy goals of limiting the effects of global atmospheric warming can only be achieved if power generation processes are profoundly decarbonized. Energy models, however, have ignored the fact that upstream emissions are associated with any energy technology. In this work we explore methodological options for hybrid life cycle assessment (hybrid LCA) to account for the indirect greenhouse gas (GHG) emissions of energy technologies using wind power generation in the UK as a case study. We develop and compare two different approaches using a multiregion input-output modeling framework - Input-Output-based Hybrid LCA and Integrated Hybrid LCA. The latter utilizes the full-sized Ecoinvent process database. We discuss significance and reliability of the results and suggest ways to improve the accuracy of the calculations. The comparison of hybrid LCA methodologies provides valuable insight into the availability and robustness of approaches for informing energy and environmental policy.

**CIASCHINI M., PRETAROLI R. AND SOCCI C. BALANCE, MANHATTAN NORM AND EUCLIDEAN DISTANCE OF INDUSTRIAL POLICIES FOR THE US. STRUCTURAL CHANGE AND ECONOMIC DYNAMICS 2011; 22(3), 204-226.**

The design of policy controls oriented to stimulate specific industrial activities highlights a set of problems that involve the choice of the macro variables that make up the policy control, the determination of their aggregate amount as well as their sectoral composition and their inner balance. In a



multi-sectoral framework these issues require a careful identification of the relationship between the scale (aggregate value) and structure (inner composition) of both the policy control and policy target. The Macro Multiplier approach identifies the complete set of aggregate scalars that are hidden within the complexity of the multi industry relations and how they are strictly linked with predetermined structures both of the policy control and of the policy target. The application exercise is performed on an Input-Output table for the US for the year 2007, the applied exercise focuses on the government strategies for the "Manufacture of Motor vehicles" sector.

**SCHARIFY N. AND SANCHO F. A NEW APPROACH FOR THE INPUT-OUTPUT PRICE MODEL.** *ECONOMIC MODELLING* 2011; 28(1-2), 188-195.

A new approach to measure the impact of a sector's price shock on price indices is proposed. It works based on table adjustments to trace the effects of any initial price shock through an iteration process. It has the same accuracy and all the capabilities of the popular Standard Leontief Price (SLP) model. A distinct advantage of the new approach compared with the SLP model, however, is its ability to measure the impact of the initial price shock on all value-added components if and when it is required. This capability enables researchers to use interindustry price analysis to tackle problems of a more real-world nature. Other advantages of this approach are its simple computational implementation, especially relevant for larger size interindustry tables, the unified way to deal with all kind of different price issues, and the yielding of an adjusted interindustry table reflecting all endogenous price adjustments in response to the initial price shock.

**MARTINOV G. V., MALKOV U. KH. DEVELOPING THE INTER-BRANCH MODEL OF REPRODUCTION AND INVESTMENT DYNAMICS.** *ECONOMICS AND MATHEMATICAL METHODS* 2011; 47 PP. 24-42. IN RUSSIAN.

The article is a part of research work of a system of dynamic models of analysis and prognosis of macro-economic relations among the goods, labor, investments and money markets (Marti-nov, 1999; Martinov, Malkov, 2001, 2002, 2003, 2007). The authors describe the inter-branch model of reproduction and investment dynamics concerning its experimental realization. A model has a dynamic character, it operates with the linear relations between production costs of material production industries and the output of goods and services in the

consequent periods and repeats the theoretical models of Leontiev, Neuman and Kantorovich (Leontiev, 1958; Kantorovich, 1964; Modelling, 1973). It is a complex of different elements of applied inter-branch dynamic models widely known in Russian economic literature (Aganbegian, Bagrinovsky, Granberg, 1970; Bara-nov, 1968; Valtukh, 1970; Granberg, 1985; Klotzvog, 1969; Kossov, 1973; Makarov, Rubinov, 1973; Shatilov, 1967).

**CORDIER M., PÉREZ AGÚNDEZ J.A., O'CONNOR M., ROCLETTE S., HECQ W. QUANTIFICATION OF INTERDEPENDENCIES BETWEEN ECONOMIC SYSTEMS AND ECOSYSTEM SERVICES: AN INPUT-OUTPUT MODEL APPLIED TO THE SEINE ESTUARY.** *ECOLOGICAL ECONOMICS* 2011; 70, 1660-1671.

The aim of this paper is to assess the possible contribution of an input-output model towards two of the basic principles of the sustainability strategy of integrated coastal zone management (ICZM) and Post-Normal Science. According to these principles, decision-support tools should offer a holistic perspective and handle high uncertainty. The difficulties in reaching sustainability are due partly to the prevailing use of "narrow-system-boundary" tools that are non-holistic. Consequently, they fail to capture important ecosystem services and ignore interdependencies between them. To comply with the basic principles, our method allows environmental assets to be evaluated in multiple units and integrates results from recent researches in natural sciences. Both enable coverage of interdependencies between ecosystem services. Thereby, we enlarge input-output modelling from the two conventional ecosystem services of sink and provisioning to the most vital ones: the supporting services. An application to the Seine estuary addresses the impacts of maritime transportation infrastructures on nursery habitats for commercial fish. The ecosystem services covered are life support and resource provisioning. Our results show that the restoration of a total of 73.7 km<sup>2</sup> of nursery areas over the period 2004-2015 would result in a stock of sole in 2015 that exceeds the "business as usual" scenario by 44.2% (uncertainty range: 35.9%-69.9%). In spite of high restoration costs, the negative macroeconomic impact is very low. However, on the sector level, a trade-off results between nurseries and three economic sectors. The quantification of such trade-offs in our model is particularly useful to public participation in decision-making.

## Book Review

**SATOSHI INOMATA ASIA BEYOND THE GLOBAL ECONOMIC CRISIS: THE TRANSMISSION MECHANISM OF FINANCIAL SHOCKS 2010.** EDWARD ELGAR, THE UNITED KINGDOM, 2011

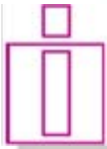


The characteristic feature of the recent global economic crisis is the speed and extent of the shock transmission. The rapid development of cross-national production networks in recent years has significantly deepened the economic interdependency between countries, and a shock that occurs in one region can be swiftly and extensively transmitted to the rest of the globe. The sudden contraction of world trade and output was a negative outcome of this intertwined global economic system. Based on the method of international input-output analyses, this book provides a detailed examination of the mechanics of shock transmission by probing the labyrinth of complex supply networks among nations.

Written for experts and non-experts alike, this book will be a valuable read for academics and students interested in global supply chains as well as researchers from private companies or consulting agencies who consider post-crisis Asia as a significant target market. Government policy makers and specialists in international organizations will also find this book of value for designing a grand scheme for economic coordination and cooperation.

Contributors: H. Escaith, F. Gonguet, K. Hayakawa, S. Inomata, I. Kuroiwa, H. Kuwamori, B. Meng, N. Okamoto, P.A. Petri, H. Sato, Y. Uchida

For further information: [www.e-elgar.com](http://www.e-elgar.com)

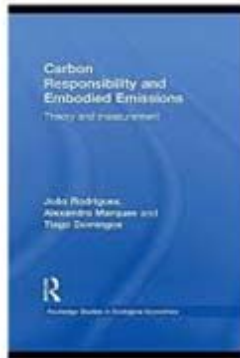


# Newsletter

## International Input-Output Association (IIOA)

Number 15; August, 2011

**RODRIGUES J. F. D., DOMINGOS T.M.D., MARQUES A.P.S. CARBON RESPONSIBILITY AND EMBODIED EMISSIONS THEORY AND MEASUREMENT 2010 BY ROUTLEDGE - 128 PAGES**



Climate change policy and the reduction of greenhouse gas emissions are currently discussed at all scales, ranging from the Kyoto Protocol to the increasingly frequent advertisement of "carbon neutrality" in consumer products.

However, the only policy option usually considered is the reduction of direct emissions. Another potential policy tool, currently neglected, is the reduction of indirect emissions, i.e., the emissions embodied in goods and services, or the payments thereof.

This book addresses the accounting of indirect carbon emissions (as embodied in international trade) within the framework of input-output analysis and derives an indicator of environmental responsibility as the average of consumer and producer responsibility. A global multi-regional input-output model is built, using databases on international trade and greenhouse gas emissions, from which embodied carbon emissions and carbon responsibilities are obtained.

Carbon Responsibility and Embodied Emissions consists of a theoretical part, concerning the choice of environmental indicators, and an applied part, reporting an environmental multi-regional input-output model. It will be of particular interest to postgraduate students and researchers in Ecological Economics, Environmental Input-Output Analysis, and Industrial Ecology.



**12 October 2011 - Final EXIOPOL Conference**

[http://www.feem-project.net/exiop/news\\_details.php?ids=&idn=12](http://www.feem-project.net/exiop/news_details.php?ids=&idn=12)

### Upcoming conferences

#### Planet Under Pressure: New knowledge towards solutions



**March 26-29 2012, London**

The 2012 international Planet Under Pressure conference will provide a comprehensive update of the pressure planet Earth is now under. The conference will discuss solutions at all scales to move societies on to a sustainable pathway. It will provide scientific leadership towards the 2012 UN Conference on Sustainable Development - Rio+20.

Building on a comprehensive update of knowledge of the Earth system and the pressure it is under, the Planet Under Pressure conference will present and debate new insights into potential opportunities and constraints for innovative development pathways based on novel partnerships.

**Abstract submission 16 September 2011**

<http://www.planetunderpressure2012.net/index.asp>

#### **CHANGE OF DATES!!** Contemporary Challenges to Monetary Policy

**Manila, Philippines  
February 28-29, 2012**

Abstract submission October 18, 2011

<http://www.bsp.gov.ph>

#### The European Economic Association and the Econometric Society European meeting (EEA-ESEM)



UNIVERSIDAD DE MÁLAGA

**Málaga, Spain from 27-31, August 2012**

The conference will be held at the Teatinos Campus of the University of Málaga. The 2012 EEA-ESEM joint meeting will feature the work and findings of the leading scholars in economics, econometrics and related fields.

**Abstract submission 15 February 2012**

<http://www.eea-esem2012malaga.org/>

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